A Biblio-Systematic Analysis of Development Planning for Better Environment: A Case Study of 4 Countries

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Abstract Regional planning is a method of development planning that leverages present resources to better a public community, government, and environment in a specific area. It is essential to gather and assess regional planning research from across the globe in order to provide informed suggestions for domestic regional planning and the implementation of suitable laws. Studies on regional planning are particularly significant when given as bibliometric analyses. The purpose of this research is to discover distinct research trends in bibliometrics relevant to the topic of regional planning. Using statistics, we examine the number of articles on regional planning that have been published in the recent five years in this study. Alois Humer, who works at the University of Vienna in Austria, has a high level of scientific production as well as recognition in this subject. Researchers studying regional planning utilize the total number of papers published in each publication to classify journals into separate regions. According to Bradford's rule of document transmission, the IOP Conference Series Earth and Environmental Science is the most significant journal on this subject. Looking at the numbers, it is also clear that China has published a total of 145 articles throughout the past five years. The word "regional planning" appears 126 times in the title, which is rather remarkable. This phrase is related to the article's keywords' theme. This image incorporates the terms "China," "Indonesia," "Germany," and "Nigeria," implying that the bulk of research on "regional planning" themes is conducted in these four nations.

Keywords Regional Planning, Bibliometrics, Biblioshiny, VOSviewer

1. Introduction

Regional planning is a development planning process that uses current resources to improve a public community, government, and environment in a given region. It must be thorough, complete, and prioritize the common good. Regional planning is a recognized part of planning practice in most nations throughout the world, tackling complicated and highly significant concerns of spatial development[1]. Regional development strategy at the national level, regional procedures of decision-making and design for investment projects, and economic development programs for subnational regions were the three distinct meanings of regional planning identified by John Friedmann in the 1960s[2]. Regional planning is often seen as a tool for

competitive metropolitan and city-regional planning or for controlling expansion in expansive mega-regions[3–5].

Patrick Geddes, in his 1915 landmark work, Cities in Evolution: an Introduction to the Town Planning Movement and the Study of Civics, established the notion of regional planning and started to construct his larger philosophy of regional planning. To show how material wealth and cultural vitality are linked, he suggested a "holistic" view of "place, work, and people". The concept of "region" plus the action of "planning" together forms the noun phrase "regional planning." There is no universally accepted definition of the term "region," which may refer to anything from a little corner of England to one-third of China. Harvey Perloff defined regional planning in 1968 as the "ordering" of activities and facilities in space on a larger scale than a single community but smaller than a nation, or on a smaller scale than an integrated totality when a number of nations share a common market[6, 7].

Integrated management of economic, social, and physical resources in a geographically restricted area is one definition of regional planning. Participatory policy design seeks to improve policymaking by including more people and more groups in the process. Ultimately, it hopes to help the government make better choices[8, 9]. According to studies[10, 11], everyone has a chance to weigh in on municipal planning decisions[12]. On the other hand, local governments often ask residents and other members of civil society with whom they have already collaborated for their thoughts. So, stakeholders who haven't been involved with or worked with local councils in the past will have to put in more effort to do so. They will have to look for opportunities to contribute and use them to have an impact on local planning.

For this reason, it is important to collect and evaluate studies of regional planning from across the world in order to provide informed recommendations for domestic regional planning and the introduction of appropriate legislation. Studies on regional planning are especially noteworthy when they are presented in the form of bibliometric analysis. This study aims to identify the various research trends in bibliometrics related to the field of regional planning. In this research, we analyze the number of publications on regional planning that have been published during the last five years by using statistics. The Dimensions database is used for the study dataset, which is then processed with Bibliometrix and viewed with Vosviewer and R-Tool[13][14, 15].

This study mostly uses bibliometrics to look at the scientific output of countries and authors in the field of regional planning research, as well as the number of articles published in journals. Price's law and Bradford's law of scattering are used to describe the laws and quasi-laws of scientific activities. Keyword cluster analysis and evolution analysis are used to learn about the trends and paths of research development[1, 14].

2. Methods

Bibliometric analysis is the use of quantitative research methods to look into the content of bibliographies. This kind of research is part of the field of library and information sciences. Alan Pritchard came up with the idea of bibliometric analysis for the first time in 1969. In fact, this way of interpreting research data in a certain field has been around since the 19th century [16]. In the past, each step of the data collection process had to be done by hand for bibliometric analysis to be done. Information and communication technology has helped speed up and make it easier for bibliometric analysis studies to grow. This is because it has made it easier for researchers to get faster access to scholarly materials in fields that interest them. This growth has happened because bibliometric analysis studies have gotten better[17, 18].

Bibliometrix processes Dimensions database crawling results. Bibliometrix is a free, open-source program for quantitative research like scientometrics, bibliometrics, and scientometric analysis. This application maps the scientific environment to show research trends and gaps on any topic. The free software includes a search index and links to all groups. Regional planning will dominate 2018–2022.

Figure 1 demonstrates bibliometrix's scientific mapping using the Dimensions dataset. Translated data followed. After that, the data analysis is written in R to be updated and used for many statistical and graphical reasons. This study's analysis uses Biblioshiny, which streamlines and simplifies mapping[15].

Topic areas and research trends are identified using existing literature and bibliometric mapping. Bibliometric visualization will be done with VOSviewer. To determine the direction of the current research, VOSviewer examines the co-occurrence of keywords and authors in relation to e-commerce in Indonesia between 2018 and 2022[14].
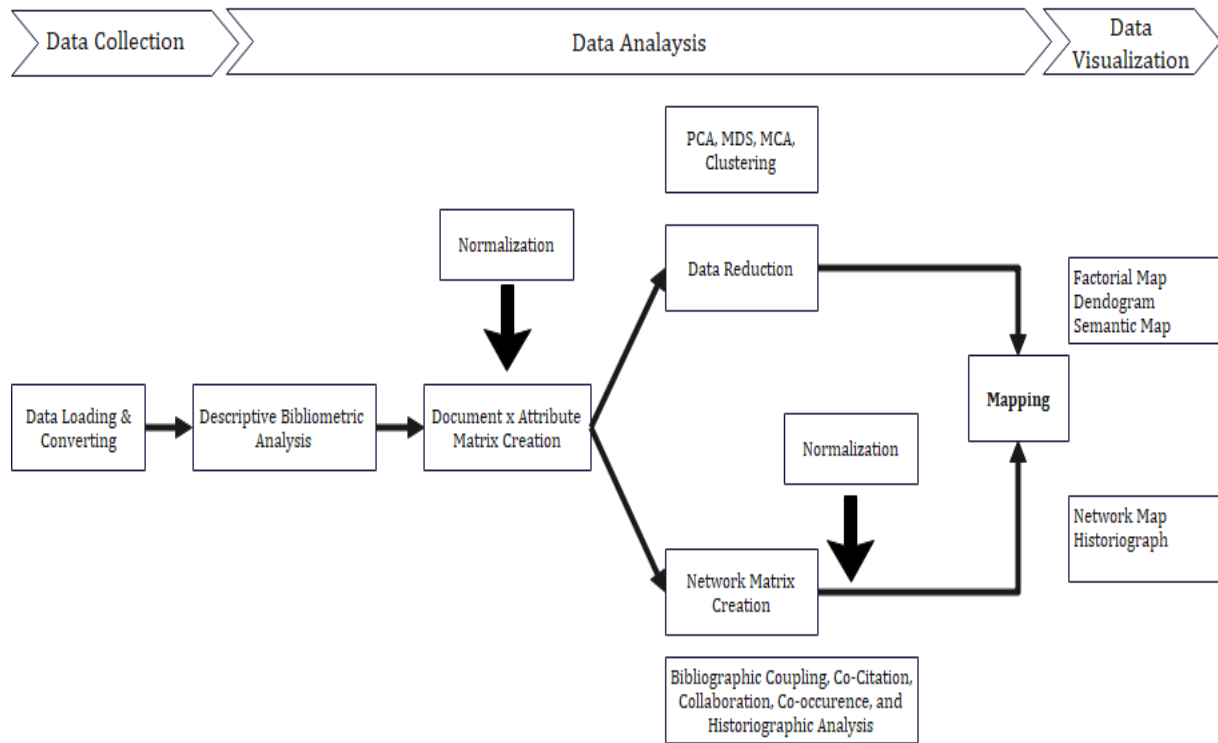
Figure 1. Science mapping workflow using Bibliometrix

3. Results and Discussion

Using the search terms "regional planning" and the range of years from 2018 to 2022, a dataset is made from the Dimensions database. Table 1 gives a quick overview of the most important parts of these numbers.

Table 1. Basic Data and Critical Information

Description	Information
Period of Time	2018:2022
Sources (Journal)	695
Documents	1166
Average number of years since publication	1.99
Average citations per documents	5.321
Average number of citations per doc per year	1.526
Authors	3339
Authors of documents with only one author	249
Documents with more than one author	3090
Documents with only one author	261
Authors for each document	2.86
Documents with Co-Authors	3.25
Collaboration Index	3.5

3.1. Analysis of the Author

The major body of scientific activity and scientific output is the author of scientific publications. According to quantitative data analysis, the average number of authors per article is 2.86. Price's law is used in this research to analyze the distribution of output efficiency examined by experts in this area[19].

Table 2 provides a list of the 10 most prolific authors in this subject, which can be used to get a better understanding of the high-productivity academics that have been working in this topic during the last five years. Not only does Alois Humer of the University of Vienna in Austria have a high scientific production, but he also has a high recognition level in the area, as was discovered by the statistics. He has been cited in 41 times, with the average number of times being 10.25. In the meanwhile, a different researcher working at the Research Institute for Regional and Urban Development in Germany by the name of Sebastian Eichhorn has the same number of papers, but we have been unable to locate any citations for him. Researchers from Aalto University, Finland, Raine Mantysalo discovered different things. Although he had the same number of papers as his colleagues, he had the greatest average number of citations, with 14 out of 56 total citations.

Table 2.   Top Ten Authors

No	Name	Affiliations	Papers	Citations	Citations Mean
1	Alois Humer	University of Vienna, Austria	4	41	10.25
2	Sebastian Eichhorn	Research Institute for Regional and Urban Development, Germany	4	0	-
3	Raine Mäntysalo	Aalto University, Finland	4	56	14.00
4	Luca Salvati	University of Macerata, Italy	3	7	2.33
5	Willow S Lung-Amam	University System of Maryland, United States	3	12	4.00
6	Stefan Greiving	TU Dortmund University, Germany	3	11	3.67
7	Shigeo Okabe	Fukuyama City University, Japan	3	1	0.33
8	Gerrit-Jan Knaap	University of Maryland, College Park, United States	3	12	4.00
9	Cilene Gomes	Universidade do Vale do Paraíba, Brazil	3	9	3.00
10	Rini Rachmawati	Gadjah Mada University, Indonesia	3	31	10.33

Table 3.   Articles with highest citation

No	Citation	Author	Title	Journal
1	213	Dadashpoor H[20]	"Land use change, urbanization, and change in landscape pattern in a metropolitan area"	Science of The Total Environment
2	184	Liang X, 2018[21]	"Delineating multi-scenario urban growth boundaries with a CA-based FLUS model and morphological method"	Landscape and Urban Planning
3	158	Wang J, 2019[22]	"A multiscale analysis of urbanization effects on ecosystem services supply in an urban megaregion"	Science of The Total Environment
4	119	Cui Z, 2020[23]	"Hybrid many-objective particle swarm optimization algorithm for green coal production problem"	Information Sciences
5	111	Long H, 2019[24]	"Rural vitalization in China: A perspective of land consolidation"	Journal of Geographical Sciences
6	108	Liang X, 2018[25]	"Urban growth simulation by incorporating planning policies into a CA-based future land-use simulation model"	International Journal of Geographical Information Science
7	105	Fang C, 2019[26]	"Modeling regional sustainable development scenarios using the Urbanization and Eco-environment Coupler: Case study of Beijing-Tianjin-Hebei urban agglomeration, China"	Science of The Total Environment
8	105	Martellozzo F, 2018[27]	"Modelling the impact of urban growth on agriculture and natural land in Italy to 2030"	Applied Geography
9	83	Kahila-Tani M, 2019[28]	"Does mapping improve public participation? Exploring the pros and cons of using public participation GIS in urban planning practices"	Landscape and Urban Planning
10	83	Ye Y, 2018[29]	"Changes in land-use and ecosystem services in the Guangzhou-Foshan Metropolitan Area, China from 1990 to 2010: Implications for sustainability under rapid urbanization"	Ecological Indicators

The number of citations for each article was determined because of the keywords that were used for this research project. The findings of the bibliometric study revealed that the following 10 papers received the most citations overall, as shown in table 3 below.

Scientific collaboration is when two or more scientists work together in a social setting to help each other understand and finish tasks related to a goal that they both want to reach. Scientists work together because they want to find new information, because research is becoming more specialized, because the infrastructure they need is complicated, and because they need to combine different kinds of knowledge and skills to deal with complex health problems. By giving researchers access to different fields of study, scientific collaboration can also help broaden the scope of a research project and spark new ideas[30].

Co-authorship looks at the most useful group of documents and the ones that have been written by the most people. In co-authorship analysis, a bibliometric network shows how academics, research institutions, and countries are linked by the number of publications they have written together. Figure 2 shows that the VOSviewer's bibliometric map of co-authorship based on author names showed two groups. A group of nodes that are linked in some way is called a cluster. In a network, each node is only part of one cluster. The number of clusters is set by a resolution parameter[31].
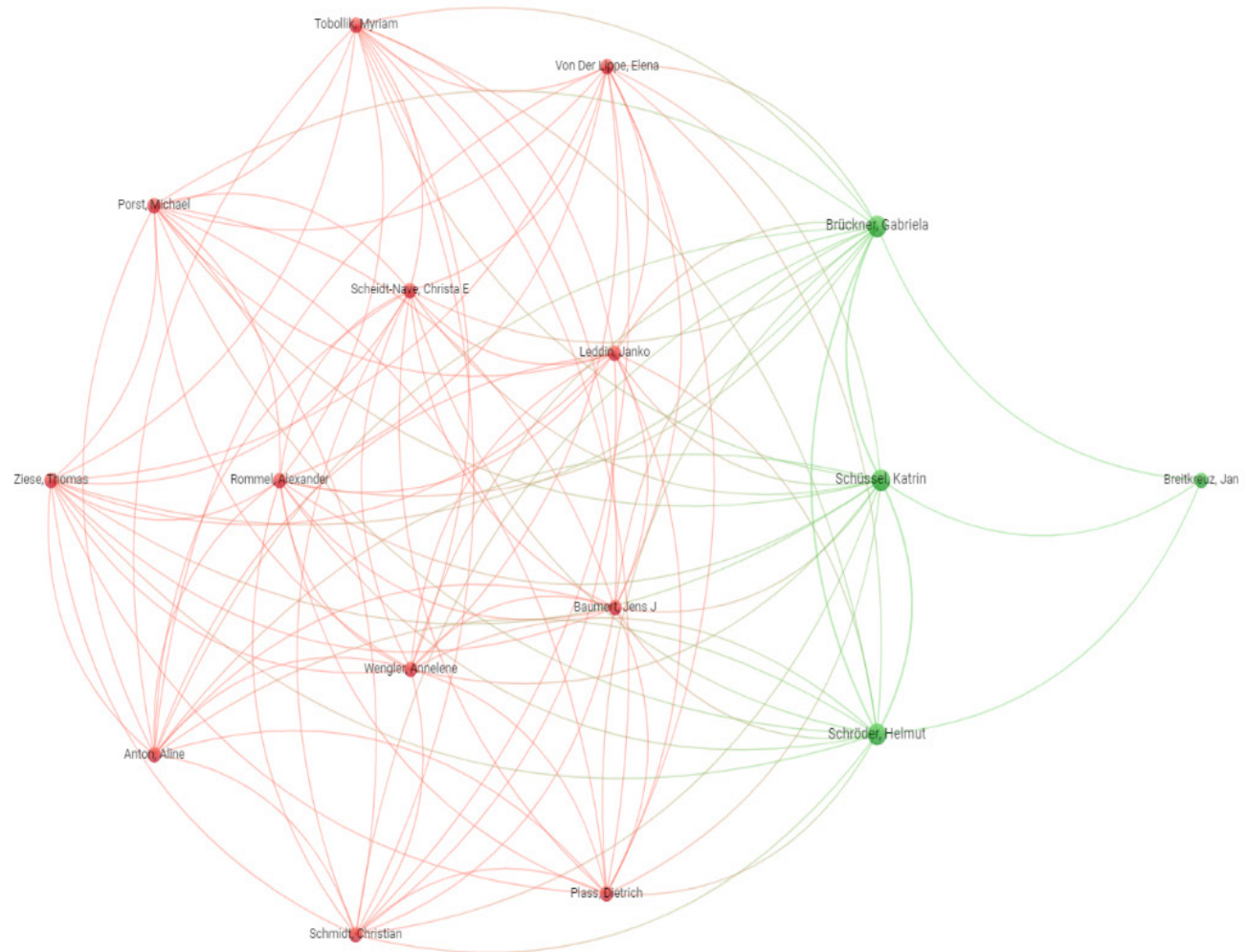
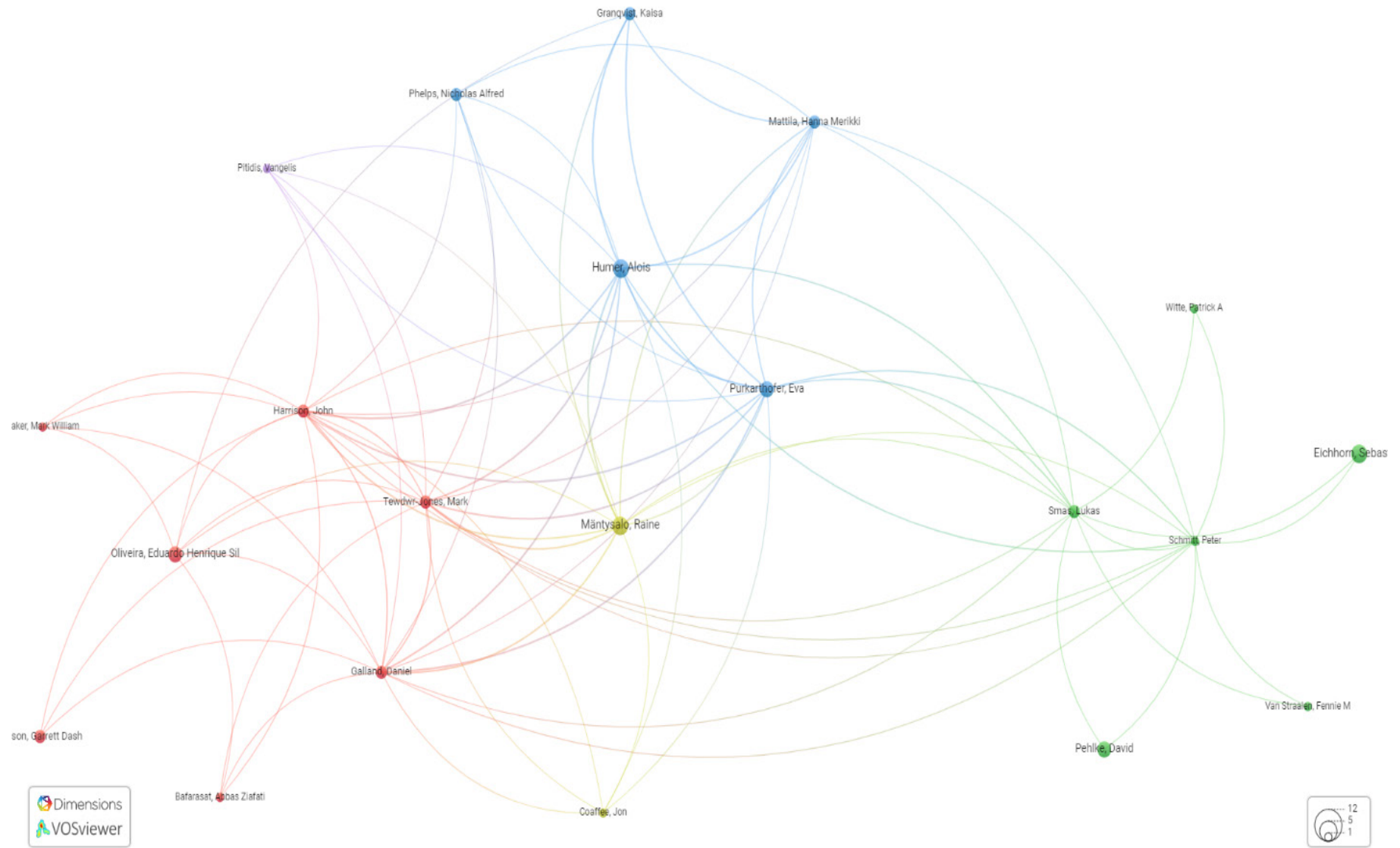**Figure 2.** Co-authorship analysis

Figure 3. Citation analysis

An example interpretation of Figure 2 reveals that 111 co-authors are distributed throughout two clusters, and there are 16 authors altogether. There are twelve authors in cluster 1, while there are only four authors in cluster 2. Cluster two's Gabriela Brückner, Katrin Schüssel, and Helmut Schroder make up the biggest cluster with a combined 17 co-authorships and 15 co-authorship linkages. This places them in the largest cluster. Researchers are considered to have a relationship with one another if they have written several articles together.

Meanwhile, it was discovered that there were five clusters of researchers who cited each other, which were combined into 21 authors, based on the number of times they cited each other. The total number of citations in these five clusters is 125, with Alois Humer from the University of Vienna at the core of the cluster in this study as seen in Figure 3.

3.2. Journal Analysis

Periodicals are important for our research and exploration because they are full of scientific information and knowledge. Statistics about the library journals show that the IOP Conference Series Earth and Environmental Science journal had the most papers on regional planning. The Sustainability Journal and the Land Use Policy Journal came in second and third, respectively. The Bradford's law of scattering is an example of a classical analytic law that is used in the field of bibliometrics to classify journals and find core journals[32].

This theorem says that the distribution of the number of professional documents in the journals to which they correspond is highly asymmetric or oblique, and that there is a certain relationship between the number of professional documents and the number of journals to which they correspond. When you look closely at these journals, you can tell the difference between the "core region," which is where the most articles were published, and the following areas, which have the same number of papers as the core region[33].

Table 4. Source Clustering Through Bradford's Law

Zone	Ranking	Number of Journals	Number of Publications
Zone 1	1-51	51	387
Zone 2	52-311	260	395
Zone 3	312-695	384	384

Based on the number of articles published in each publication, regional planning research divides journals into different regions (as demonstrated in Table 4). At this point, you can probably find about the same number of papers in each of the three zones. Based on Bradford's law of document distribution, you could say that The IOP Conference Series Earth and Environmental Science is the core journal in this field. However, other journals in related areas, like Sustainability and Land Use Policy, are very related to this field and should be considered part of this field.

We can determine which journals in the area are of the highest quality by conducting more research on the citations of works that have been published in journals. Table 5 provides a ranking of the top ten publications in this discipline based on the total number of citations received by each article. The Science of the Total Environment has received a total of 547 citations, making it one of these. It is a well-respected journal in this field of study, and it is responsible for publishing a great deal of scholarly research.

3.3. Country Analysis

By making use of the VOS viewer and creating a publishing volume and collaboration map in the manner depicted in Figure 4 for nations that have a publication volume of more than 25. Due to the fact that China and US are responsible for the majority of the publications in this domain, in the last five years, the country has emerged as the primary driving force behind the publishing of papers in this sector.

Table 5. Impact Measure (Total Citation)

| Ranking	Journal	H-Index	G-Index	Total Citation
1	The Science of The Total Environment	7	9	547
2	Landscape and Urban Planning	4	6	287
3	Ecological Indicators	5	5	198
4	Sustainability	9	11	168
5	Journal of Cleaner Production	5	7	143
6	Journal of Geographical Sciences	2	3	137
7	Land Use Policy	7	11	137
8	Applied Geography	2	2	135
9	Cities	6	10	133
10	International Journal of Geographical Information Science	2	2	125
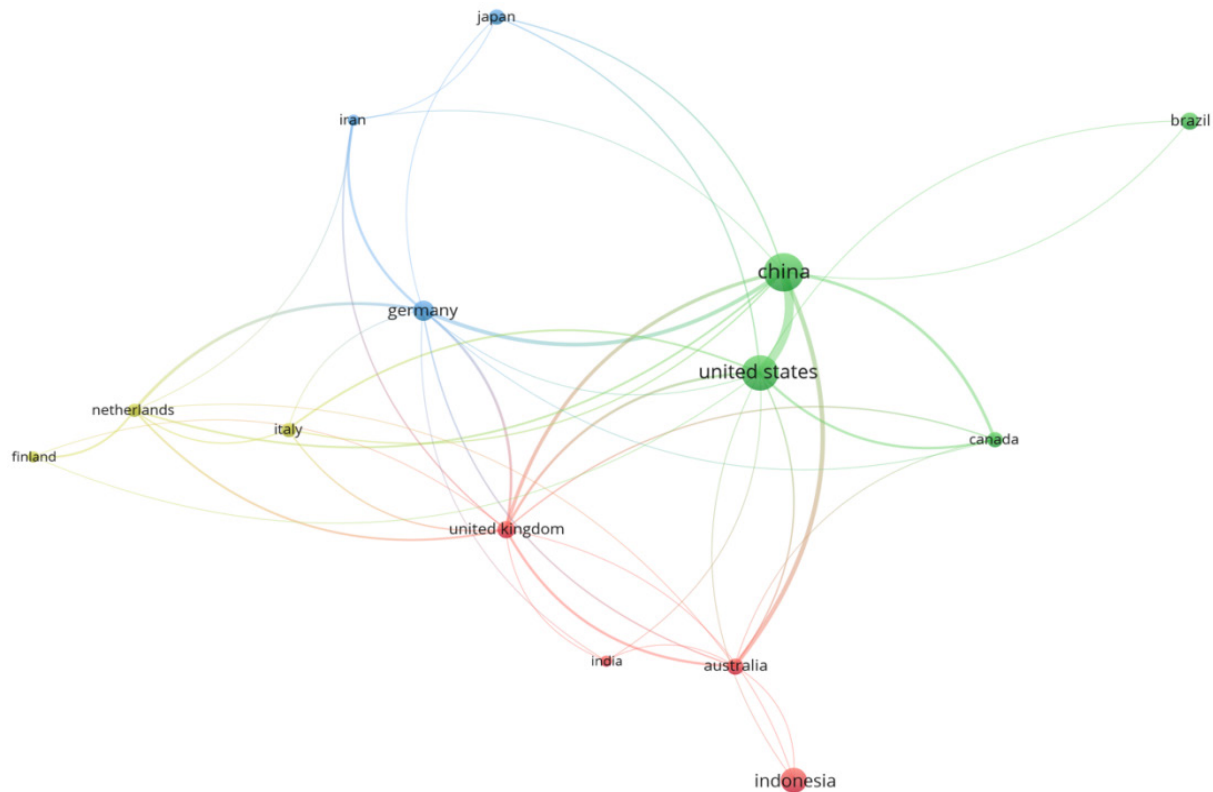
Figure 4.   Co-Authorship Analysis by Country

Table 6.   Country Impact Measure (Total Citation)

Ranking	Country	Documents	Citations	Total Link Strength
1	China	145	2176	53
2	United States	125	1101	37
3	United Kingdom	41	439	26
4	Germany	54	513	22
5	Australia	37	507	19
6	Netherlands	27	375	14
7	Canada	35	259	13
8	Italy	32	328	10
9	Japan	34	71	5
10	Indonesia	76	73	3

This study conducts a more in-depth investigation of the top ten countries, as shown in Table 6, to gain a deeper comprehension of the nations that are responsible for such high levels of scientific production in this area. It is clear from looking at the data that China has published a total of 145 articles throughout the course of the last five years. The United States comes in second place with a total of 125 papers, while the United Kingdom comes in third with 41 articles. This country has the highest scientific production in the subject. Continuing with the index of the average citation times of the comparative articles, which is a reflection of the quality of the articles, it can be seen that China has the most significant with a total of 2176 citations.

3.4. Research Trend

Keywords get to the heart of what a document is about. Using term co-occurrence analysis, we can find a research hotspot in a scientific field. We use the VOS viewer to make a keyword co-occurrence map of 1166 papers. For visualization, we choose important keywords that appear more than or as often as 10 times. This gives us a total of 2824 terms. Figure 5 shows what was found. The keywords appear more often when the circle node in Figure 5 is bigger. The strength of the link is shown by the size of the circle node. The more times a link shows up in the same document, the stronger it is.
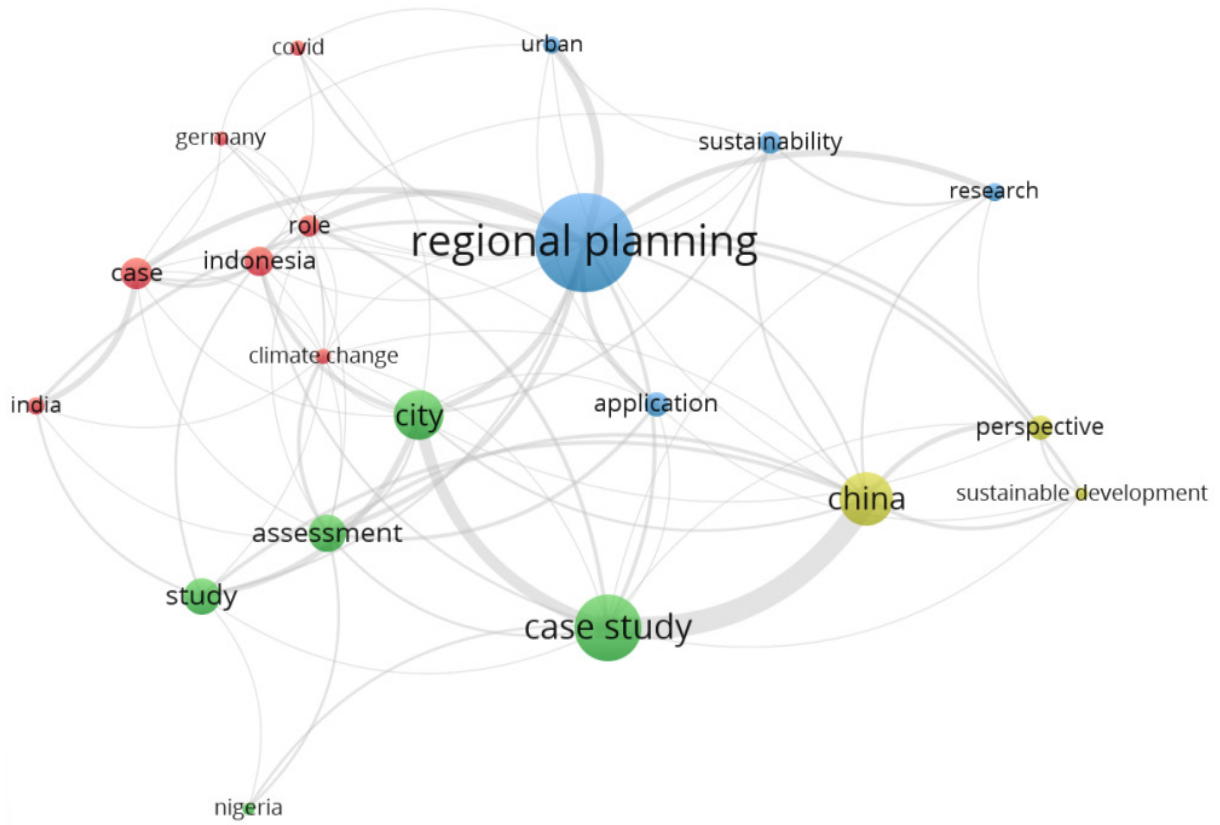
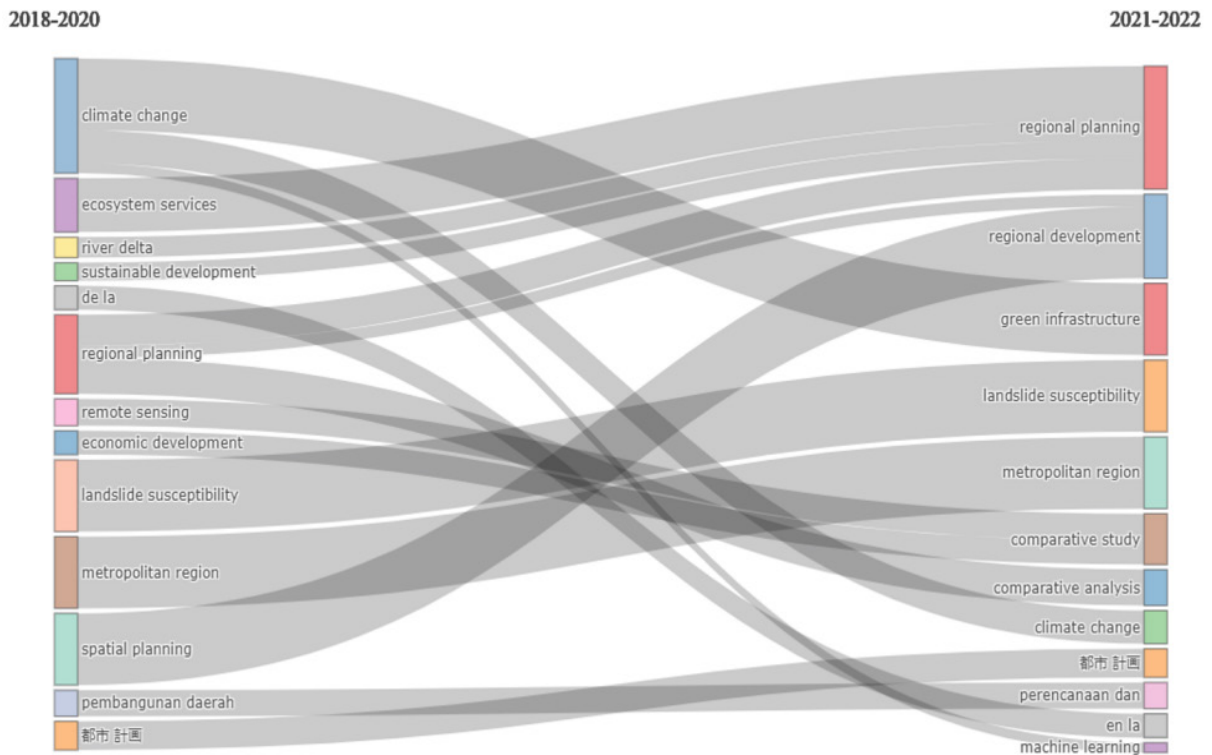**Figure 5.**   Co-Occurrence Term Map Based on Title

Figure 6.   Thematic Evolution in Regional Planning Study

Figure 5 shows a visualization of Co-Occurrence Term by Title. The word 'regional planning' appears the most in the title, appearing 126 times. The terms 'China,' 'Indonesia,' 'Germany,' and 'Nigeria' are featured in this

image, indicating that research subjects linked to 'regional planning' are predominantly carried out in these four nations.

Figure 6 illustrates the development of and connections between several study subjects during the course of two different phases of investigation. The features of the lines provide information about the quality of the relationships that exist between the keywords. With the help of the map that shows how themes change during the scientific production process, research topics can be put into motor and basic themes[34]. According to Figure 6, we can see that there is a significant amount of connectivity between the study areas. There are many distinct study fields, yet some of those fields are home to issues that are closely related to one another and share many commonalities. At the same time, we are able to recognize study themes that have been emphasized by other people by looking at the map of the thematic progression. For instance, the subject of "climate change," which was a hot topic between the years 2018 and 2020, shifted its focus to "green infrastructure" between the years 2021 and 2022.

4. Conclusions

According to the papers that were published on a worldwide scale, the study examined the rise in the number of scientific and academic publications pertaining to regional planning. Bibliometric mapping of research on e-commerce issues in Indonesia carried out with the use of Biblioshiny and VOSviewer resulted in the production of 1166 relevant articles that were published in 695 journals between 2018 and 2022. Alois Humer, who works at the University of Vienna in Austria, not only has a high level of scientific productivity, but he also has a high degree of recognition in this field. According to the findings of this study, there are a total of 16 authors and 111 co-authors who are organized into two distinct clusters. Within cluster 1, there are a total of twelve different writers, whereas cluster 2 has only four different authors. The largest cluster consists of Gabriela Brückner, Katrin Schüssel, and Helmut Schroder from Cluster Two. Between the three of them, they have a total of 17 co-authored works and 15 links between their co-authored works. The total number of articles that are published in each publication is used by researchers investigating the topic of regional planning to categorize journals into distinct areas. On the basis of Bradford's rule of document dissemination, it is feasible to consider that the IOP Conference Series Earth and Environmental Science is the most important journal on this topic. This theory is supported by the fact that it is the most widely read publication in the field. When looking at the statistics, it is also obvious that China has published a total of 145 articles throughout the course of the previous five years. The United Kingdom comes in third place with a total of 41 articles, while the United States of America comes in second place with a total of 125 publications. The phrase "regional planning" is mentioned the most in the title, totaling 126 times. This term is associated with the topic of the article's keywords. This graphic includes the words "China," "Indonesia," "Germany," and "Nigeria," which suggests that the majority of study on topics related to "regional planning" is carried out in these four countries.

REFERENCES

[1] E. Purkarthofer, A. Humer, and R. Mäntysalo, "Regional planning: an arena of interests, institutions and relations.," *Regional Studies*. vol. 55, no. 5, pp. 773–777, 2021.

[2] J. Friedmann, "Regional Planning as a Field of Study.," *Journal of the American Institute of Planners*. vol. 29, no. 3, pp. 168–175, 1963.

[3] A. Schafran, "Rethinking Mega-Regions: Sub-Regional Politics in a Fragmented Metropolis.," *Regional Studies*. vol. 48, no. 4, pp. 587–602, 2014.

[4] K. Ward and A.E.G. Jonas, "Competitive City-Regionalism as a Politics of Space: A Critical Reinterpretation of the New Regionalism.," *Environment and Planning A: Economy and Space*. vol. 36, no. 12, pp. 2119–2139, 2004.

[5] Y. Pahala, V. Basa, S. Sidjabat, et al., "The Influence of Load Factor, Headway, and Travel Time on Total Fleet Requirements and Its Implications for Public Transportation Maintenance Management on Transjakarta.," *Review of International Geographical Education Online*. vol. 11, no. 5, pp. 3422–3436, 2021.

[6] C. Wong, "Regional Planning: China.," In: *International Encyclopedia of the Social & Behavioral Sciences*. pp. 134–140. *Elsevier* (2015).

[7] R.D.R. Hidayat, B. Fahriza, L. Agusinta, A. Setyawan, and S. Marina, "Study of the formation of National Logistics Cluster for Disaster Management (KLASNASLOG PB) by National Disaster Management Authority (BNPB) to streamline transport for disaster management in Indonesia.," *MATEC Web of Conferences*. vol. 229, p. 2018.

[8] P. de Smedt and K. Borch, "Participatory policy design in system innovation.," *Policy Design and Practice*. vol. 5, no. 1, pp. 51–65, 2022.

[9] D.A. Johnson, "Regional Planning, History of.," In: *International Encyclopedia of the Social & Behavioral Sciences*. pp. 141–145. *Elsevier*, 2015.

[10] M. Roman and K. Fellnhofer, "Facilitating the participation of civil society in regional planning: Implementing quadruple helix model in Finnish regions.," *Land Use Policy*. vol. 112, p. 105864, 2022.

[11] R. Karolina, Syahrizal, and N. Bahri, "Optimization of fly ash and bottom ash substitution against paving block manufacture according to SNI 03-0691-1996.," *IOP Conference Series: Materials Science and Engineering*. vol. 309, p. 012134, 2018.

[12] R. Karolina, W. Muhammad, M.D.S.M. Saragih, and T. Mustaqa, "The effectiveness of stone ash and volcanic ash of mount Sinabung as a filler on the initial strength of

self-compacting concrete.," *IOP Conference Series: Materials Science and Engineering*. vol. 308, p. 012045, 2018.

[13] H.S. Batubara, M. Giatman, W. Simatupang, and R. Watrianthos, "Pemetaan Bibliometrik Terhadap Riset pada Sekolah Menengah Kejuruan Menggunakan VOSviewer.," *EDUKATIF: JURNAL ILMU PENDIDIKAN*. vol. 4, no. 1, pp. 233–239, 2021.

[14] N.J. van Eck and L. Waltman, "Software survey: VOSviewer, a computer program for bibliometric mapping.," *Scientometrics*. vol. 84, no. 2, pp. 523–538, 2010.

[15] M. Aria and C. Cuccurullo, "bibliometrix : An R-tool for comprehensive science mapping analysis.," *Journal of Informetrics*. vol. 11, no. 4, pp. 959–975, 2017.

[16] F.J. Martínez-López, J.M. Merigó, L. Valenzuela-Fernández, and C. Nicolás, "Fifty years of the *European Journal of Marketing*: a bibliometric analysis,." *European Journal of Marketing*. vol. 52, no. 1/2, pp. 439–468, 2018.

[17] N. Roig-Tierno, T.F. Gonzalez-Cruz, and J. Llopis-Martinez, "An overview of qualitative comparative analysis: A bibliometric analysis.," *Journal of Innovation & Knowledge*. vol. 2, no. 1, pp. 15–23, 2017.

[18] M. Gaviria-Marin, J.M. Merigo, and S. Popa, "Twenty years of the *Journal of Knowledge Management:* a bibliometric analysis,." *Journal of Knowledge Management*. vol. 22, no. 8, pp. 1655–1687, 2018.

[19] Y. Luo, X. Zhang, and P. Jin, "Research Hotspot and Evolution Trend of REITs Since the New Century—from the Perspective of Bibliometrics.," *Journal of Innovation and Social Science Research*. vol. 9, no. 4, p. 2022.

[20] H. Dadashpoor, P. Azizi, and M. Moghadasi, "Land use change, urbanization, and change in landscape pattern in a metropolitan area.," *Science of The Total Environment*. vol. 655, pp. 707–719, 2019.

[21] X. Liang, X. Liu, X. Li, Y. Chen, H. Tian, and Y. Yao, "Delineating multi-scenario urban growth boundaries with a CA-based FLUS model and morphological method.," *Landscape and Urban Planning*. vol. 177, pp. 47–63, 2018.

[22] J. Wang, W. Zhou, S.T.A. Pickett, W. Yu, and W. Li, "A multiscale analysis of urbanization effects on ecosystem services supply in an urban megaregion.," *Science of The Total Environment*. vol. 662, pp. 824–833, 2019.

[23] Z. Cui, J. Zhang, D. Wu, et al., "Hybrid many-objective particle swarm optimization algorithm for green coal production problem.," *Information Sciences*. vol. 518, pp. 256–271, 2020.

[24] H. Long, Y. Zhang, and S. Tu, "Rural vitalization in China: A perspective of land consolidation.," *Journal of Geographical Sciences*. vol. 29, no. 4, pp. 517–530, 2019.

[25] X. Liang, X. Liu, D. Li, H. Zhao, and G. Chen, "Urban growth simulation by incorporating planning policies into a CA-based future land-use simulation model.," *International Journal of Geographical Information Science*. vol. 32, no. 11, pp. 2294–2316, 2018.

[26] C. Fang, X. Cui, G. Li, et al., "Modeling regional sustainable development scenarios using the Urbanization and Eco-environment Coupler: Case study of Beijing-Tianjin-Hebei urban agglomeration, China.," *Science of The Total Environment*. vol. 689, pp. 820–830, 2019.

[27] F. Martellozzo, F. Amato, B. Murgante, and K.C. Clarke, "Modelling the impact of urban growth on agriculture and natural land in Italy to 2030.," *Applied Geography*. vol. 91, pp. 156–167, 2018.

[28] M. Kahila-Tani, M. Kytta, and S. Geertman, "Does mapping improve public participation? Exploring the pros and cons of using public participation GIS in urban planning practices.," *Landscape and Urban Planning*. vol. 186, pp. 45–55, 2019.

[29] Y. Ye, B.A. Bryan, J. Zhang, et al., "Changes in land-use and ecosystem services in the Guangzhou-Foshan Metropolitan Area, China from 1990 to 2010: Implications for sustainability under rapid urbanization.," *Ecological Indicators*. vol. 93, pp. 930–941, 2018.

[30] B. de P.F. e Fonseca, R.B. Sampaio, M.V. de A. Fonseca, and F. Zicker, "Co-authorship network analysis in health research: method and potential use.," *Health Research Policy and Systems*. vol. 14, no. 1, p. 34, 2016.

[31] H.F. Anjum, S.Z.A. Rasid, H. Khalid, et al., "Mapping Research Trends of Blockchain Technology in Healthcare.," *IEEE Access*. vol. 8, pp. 174244–174254, 2020.

[32] N. Desai, L. Veras, and A. Gosain, "Using Bradford's law of scattering to identify the core journals of pediatric surgery.," *Journal of Surgical Research*. vol. 229, p. 2018.

[33] G.T. Venable, B.A. Shepherd, C.M. Loftis, et al., "Bradford's law: Identification of the core journals for neurosurgery and its subspecialties," 2016.

[34] Anatol MELEGA, "BIBLIOMETRIC ANALYSIS OF SCIENTIFIC PRODUCTION REGARDING THE HARMONIZATION OF ACCOUNTING IN BRICS EMERGING ECONOMIES.," *EUROPEAN JOURNAL OF ACCOUNTING, FINANCE & BUSINESS*. vol. 10, no. 1, p. 2022.